Casts of Sterilized/Disinfected Impressions, Long Term Evaluation

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INTRODUCTION

A successful rehabilitation depends on many factors such as dimensional stability, detail reproduction of impressions and models (Hamalian et al., 2011). Taking impressions is one of the crucial steps when it comes to oral rehabilitation. Impression quality determines the optimal adjustment of the restoration (Rupp et al., 2005; Balkenhol et al., 2010).

The aim of the impression material is to obtain a replica of the hard and soft tissues of the oral cavity in three dimensions and has to be dimensionally stable (Craig e Powers, 2002; Hamalian et al., 2011).

Nowdays, elastomers are considered the standard of care as the material for definitive impressions in Fixed Prosthodontics (Lee, 1999). Within the family of elastomers we can find polysulfides, condensation silicones, addition silicones and polyethers (Noort, 2007). The addition silicones and polyethers tend to be used most frequently due to it's physical and mechanical properties (Lee, 1999; Hamalian et al., 2011).

Disinfection procedures weren't used until the twentieth century. Impressions are contaminated by plaque, blood or saliva creating a vehicle of cross-infection for a variety of pathogens such as HIV, Hepatitis B, herpes, tuberculosis. Therefore it is necessary to control cross infection in clinical practice (Drennon e Johnson, 1990; Martin et al., 2007; Thomas et al., 2008; Rentzia et al., 2011).

The ADA Specification nº19 (1977) states that the maximum negative change in dimension 0,5% and the ISO 4823:2000 has a maximum of 1,5%.

OBJECTIVES

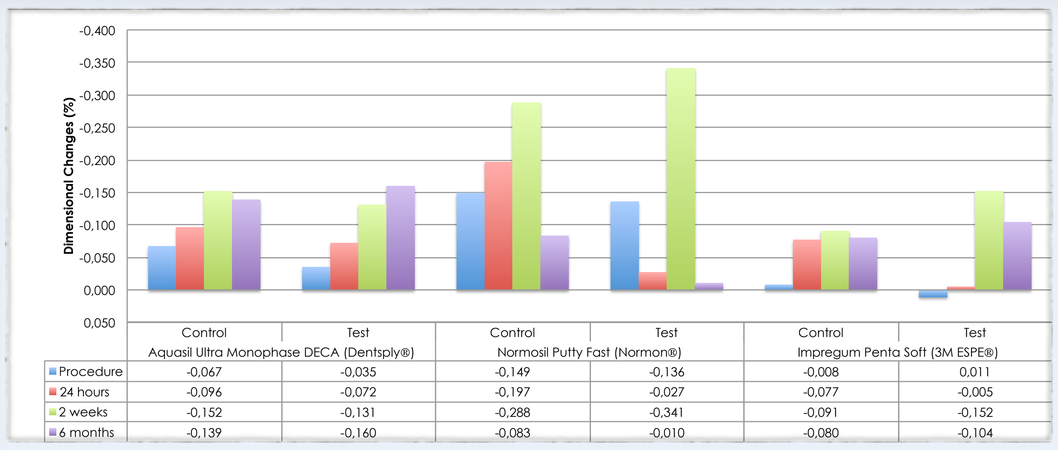
Study the dimensional changes on gypsum casts poured with 2 addition silicones and a polyether, after the impressions were steam autoclave sterilized and stored.

HYPOTHESIS

When subjected to autoclaving, the addition silicones and polyether suffer dimensional changes, resulting in casts with different dimensions of the matrix.

When subjected to autoclaving, the addition silicones and polyether don't suffer dimensional changes, resulting in casts with similar dimensions to the matrix.

RESULTS AND DISCUSSION



	Aquasil Ultra Monophase DECA (Dentsply®)		Normosil Putty Fast (Normon®)		Impregum Penta Soft (3M ESPE®)	
	Control	Test	Control	Test	Control	Test
Procedure	-0,067	-0,035	-0,149	-0,136	-0,008	0,011
24 hours	-0,096	-0,072	-0,197	-0,027	-0,077	-0,005
2 weeks	-0,152	-0,131	-0,288	-0,341	-0,091	-0,152
6 months	-0,139	-0,160	-0,083	-0,010	-0,080	-0,104

The Impregum™ Penta™ Soft Polyether (3M ESPE™) casts had the most similar dimensions to the matrix with a maximum dimensional change of 0,15% after 2 weeks in B group and a maximum of 0,09% in A group after the same period. The Normosil Adición Putty Fast (Normon©) casts showed the most evident differences after 2 weeks with a maximum dimensional change of 0,29% and 0,34% in A and B group.

CONCLUSIONS

The null hypothesis is rejected.

The gypsum casts shows dimensional changes of the impression materials after autoclaving.

The dimensional changes are below the maximum allowed by ADA Specification nº19 (1977) and ISO 4823:2000, therefore the steam autoclave sterilization should be considered a valuable disinfection procedure.

MATERIAL AND METHODS

Impregum™ Penta™ Soft Polyether (3M ESPE™)

Aquasil Ultra Monophase (Dentsply®)

Normosil Adición Putty Fast (Normon©)

Pentamix 2 (3M ESPE™)

Metallic matrix side view

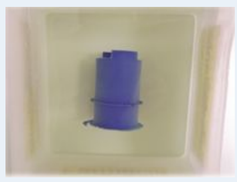
Metallic matrix top view

A group - 5 samples

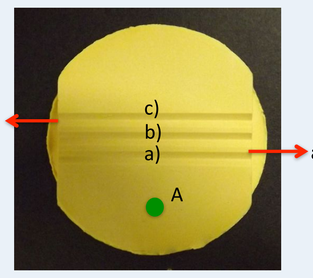
B group - 5 samples

Chemical disinfection with sodium hypochlorite 5,25% - 10 min.

Chemical disinfection with sodium hypochlorite 5,25% - 10 min. + Steam autoclave sterilization at 134ºC - 25 min.



Gypsum casts



a, b, c, ab and bc measured and averaged

Measurement example

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